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Are Online Sexual Activities and Sexting Good for Adults' Sexual Well-Being? Results From a National Online Survey

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ABSTRACT

Objectives: Online sexual activities (OSA) and sexting are often framed as risk behaviors in adolescents. This study investigates experiences of adults. **Methods:** Based on the positive sexuality approach, the current study measured prevalence, predictors, and perceived outcomes of OSA and sexting in a national online sample of $N=1,500$ participants from Germany (ages 18–85). **Results:** 68% of adults reported previous involvement in OSA and 41% in sexting. Perceived positive OSA and sexting outcomes outweighed the negative. **Conclusions:** Sexual health professionals should acknowledge online sexual expression in adults of the general population as normal and mostly positive behavior.

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Cybersexuality; sexting;
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Introduction

In the digital age, many new forms of sexual expression via digital media have developed. Since the popularization of online communication in the early 1990s, people all over the world have been using the internet with their desktop computers and laptops for sexual purposes. *Online sexual activities* (OSA) is an umbrella term for various sexuality-related activities that occur offline (e.g., the use of offline pornography and offline dating) that are now also taking place in online contexts (e.g., the use of online pornography and online dating; Döring, 2009). OSA can be subdivided into six main areas: involvement with (a) sexuality information/education, (b) erotica/pornography, (c) adult dating/cybersex, (d) sexual scenes/communities, (e) sexual merchandise/sex shops, and (f) sex work on the internet (Döring, 2009, 2012; Döring, Daneback, Shaughnessy, Grov, & Byers, 2017; Shaughnessy, Byers, & Walsh, 2011; Shaughnessy, Fudge, & Byers, 2017). This OSA taxonomy covers a broad spectrum of sexuality-related activities, with some types of OSA related to sexual arousal, be it solo-arousal (e.g., solitary use of online pornography)

or partnered-arousal (e.g., shared use of online pornography), whereas other types of OSA are mostly unrelated to sexual arousal (searching for sexuality information; Shaughnessy et al., 2011; Shaughnessy et al., 2017). However, all six types of OSA can have a direct effect on sexual well-being: (a) finding sexual advice online, (b) finding sexually explicit content online, (c) finding sexual partners online, (d) finding sexual minority communities online, (e) finding sex toys online, and (f) finding sex workers online can each—depending on the circumstances—improve and/or impair an individual's sexual well-being.

Since the popularization of feature phones (i.e., mobile phones that provide text messaging and basic multimedia and internet capabilities) in the late 2000s and their replacement by smartphones in the early 2010s, people have also been using their mobile phones for sexual purposes—including so-called sexting. *Sexting* is defined as the exchange of self-produced sexual texts, photos, and videos via mobile phones or social media (Klettke, Hallford, & Mellor, 2014). As most people own mobile phones with integrated photo and video cameras and have their mobile phones

with them all the time, taking and exchanging self-created intimate digital pictures has become effortless, discreet, and practically cost-free.

Overall, the widespread use of digital media has been facilitating involvement in various sexual activities. In the pre-digital age, a certain effort was necessary to access video pornography (i.e., visiting a video library to rent a video) or to produce a sexual self-portrait (i.e., purchasing a film, accessing a photo camera with self-timer and tripod, having film developed). In comparison, these and other technologically enhanced sexual activities are easily facilitated by today's internet and mobile phone users with a simple click or tap.

The intersection of digital media and sexual expression has stirred a lot of controversy and concern both in public and academic discourses: Online pornography, for instance, has been blamed by mass media for more than 20 years for corrupting youth and creating a "generation porn" (e.g., Elmer-Dewitt, 1995; Gernert, 2010). Mass media have often spoken of a "dangerous sexting epidemic" among adolescents for almost 10 years (e.g., Moore, 2016; Stephey, 2009). Academic publications often criticized the scandalization, pathologization, or even criminalization of both OSA and sexting among young people as moral panics (e.g., Hasinoff, 2015; Karaian & Tompkins, 2015; Kuipers, 2006; O'Sullivan, 2014; Potter & Potter, 2001). However, many scientific publications still focus only on the harmful consequences of OSA and sexting and predominantly regard them as deviant or risky behaviors in young people that should be prevented (Döring, 2014).

So far, 10 literature reviews about sexting are available (Anastassiou, 2017; Cooper, Quayle, Jonsson, & Svedin, 2016; Courtice & Shaughnessy, 2017; Klettke et al., 2014; Kosenko, Luurs, & Binder, 2017; Krieger, 2017; Lewis et al., 2013; Madigan, Ly, Rash, van Ouytsel, & Temple, 2018; van Ouytsel, Walrave, Ponnet, & Heirman, 2015; Wilkinson, Whitfield, Hannigan, Azam Ali, & Hayter, 2016), and they especially or exclusively frame sexting as risky and harmful behavior with only one exception (Anastassiou, 2017, addressing well-being effects). There is only one literature review regarding OSA available that covers all six OSA subtypes and their consequences (Döring,

2009). This review notes a general research bias toward the risks of, as opposed to the opportunities of internet sexuality. Other OSA-related literature reviews cover specific populations, selected OSA subtypes, and/or negative outcomes only (e.g., gay and bisexual men's OSA in relation to HIV/AIDS: Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014; online infidelity as a result of online dating; Hertlein & Piercy, 2006; or online sex addiction as a consequence of OSA gone awry; Griffiths, 2012).

Based on the positive sexuality framework (Williams, Thomas, Prior, & Walters, 2015) and the positive technology framework (Riva, Baños, Botella, Wiederhold, & Gaggioli, 2012), which are both rooted in the positive psychology approach (Seligman & Csikszentmihalyi, 2014), this paper approaches sexual expression via digital media from a different perspective. Instead of focusing only on young people and negative outcomes, the current study addresses adults and covers both negative and positive perceived outcomes of OSA and sexting. The *positive technology framework* is defined as "the scientific and applied approach to the use of technology for improving the quality of our personal experience," where this positive experience is further differentiated into affective quality, engagement/actualization, and connectedness (Riva et al., 2012, p. 70). Positive experience in the positive technology framework is thus closely related to personal well-being, just as the positive sexuality approach focuses on sexual and overall well-being (Williams et al., 2015, p. 7):

The task is not to identify what people are doing wrong and then to add something external to correct it (deficit approach), but to recognize the things that people do, or have done, well, along with the underlying, contributing strengths that allow for success. [...] Positive sexuality, then, is concerned with how people are, or can be, happy and fulfilled with their unique sexualities and sexual expression, which contributes to their overall wellbeing and quality of life.

Both frameworks reject a one-sided, negative standpoint. However, investigating sexual expression via digital media within a positive sexuality framework (Williams et al., 2015), as well as a positive technology framework (Riva et al., 2012), does not intend to glorify the phenomena. OSA

and sexting can have mild to serious negative outcomes under certain circumstances (e.g., misinformation regarding sexuality and sexual health; risk of sexual exploitation of minors; problematic overuse of online pornography; sexual harassment and stalking online; infidelity or unsafe sex in the context of online dating; abuse of sexting images in the form of revenge porn, cyberbullying or blackmailing; e.g., Döring, 2009, 2014; Griffiths, 2012; Grov, Gillespie, Royce, & Lever, 2011; Hertlein & Piercy, 2006; Kosenko et al., 2017; van Ouytsel et al., 2015; Wolak, Finkelhor, Mitchell, & Ybarra, 2008). However, to gain a more balanced and complete picture of adults' sexual expression via digital media, positive outcomes should not be ignored.

Previous studies point to a variety of positive outcomes of OSA and sexting, including sexual exploration and a broadening of one's sexual horizon, identity-validation, improved body image, finding sexual partners, enhanced intimacy in sexual relationships, improved sexual communication, fulfillment of sexual desires, and increased sexual pleasure in solo and partnered sex (Daneback, Sevcikova, Månsson, & Ross, 2013; Döring, 2009, 2014; Grov et al., 2011). Sometimes, studies investigating negative outcomes instead found positive outcomes (e.g., Currin, Hubach, Sanders, & Hammer, 2017; Perkins, Becker, Tehee, & Mackelprang, 2014). Only very few studies measured both negative and positive outcomes and compared their effect sizes. These studies revealed that positive outcomes outweighed the negative (e.g., Grov et al., 2011; Shaughnessy, Byers, Clowater, & Kalinowski, 2014).

The positive technology and the positive sexuality approaches encourage us to investigate further the prevalence of technologically enhanced sexual expression and their negative and positive outcomes. Increased empirical knowledge in this field may help to empower adults and young people to use digital media wisely and to foster their sexual well-being and happiness. Sexual well-being is an important issue, as it contributes to overall well-being and is considered to be a central factor of sexual health and overall health (Diamond & Huebner, 2012; World Health Organization, 2006).

Against this backdrop, the current study aims to answer four research questions based on a national sample of adults from Germany. As sexuality-related digital media use in Germany resembles digital media use in other Western countries (Döring et al., 2017), results may be generalizable to other countries to a certain degree. Although internet and mobile phone penetration in Germany and other Western countries is high (Internet Society, 2016), and it is therefore very easy to become involved in OSA and sexting, data on the current prevalence of OSA and sexting among adults in Germany or in other Western countries are rare. Older studies, based mostly on samples of adults from the United States, reported prevalence rates between 10% and 54% for sending sexting messages (Döring, 2014). A newer study reported a prevalence rate of 21% for sending sexual text messages among adult singles in the United States (Garcia et al., 2016). A recent review across multiple studies from different regions (mostly the United States and Europe) reported prevalence rates between 54% to 78% for sending and between 63% to 80% for receiving sexual photos/videos/texts among adults (Courtice & Shaughnessy, 2017). Regarding OSA, the study by Döring et al. (2017) across Sweden, Germany, Canada, and the United States found that lifetime prevalence rates for OSA among adults only slightly depend on the country, but strongly depend on the subtype of OSA (sexuality information/education: 90%; erotica/pornography: up to 77%; sexual merchandise/sex shops: up to 49%; adult dating/cybersex: up to 31%; sexual scenes/communities: 14%; sex work: 1%). Nevertheless, the rarity of current population data on OSA and sexting prevalence, as well as predictors of involvement in OSA and sexting, were identified as a major *research gap* in previous literature reviews (Döring, 2009; Klettke et al., 2014; Kosenko et al., 2017). To bridge this gap, the first two research questions addressed in this paper are:

RQ1: How prevalent and how frequent is sexual expression via digital media in the forms of OSA and sexting among adults in Germany?

RQ2: Which background variables (gender, age, marital status, education, sexual identity) predict involvement in OSA and sexting among adults in Germany?

Furthermore, most of the literature to date has mainly framed OSA and sexting as risky and harmful behaviors. The positive sexuality framework does take negative consequences seriously, but, at the same time, it acknowledges the possibility of positive OSA and sexting outcomes. Nonetheless, the investigation of positive outcomes of sexual expression via digital media has been identified as another research gap (Döring, 2009, 2014; Perkins et al., 2014). This gap is addressed by the following research questions:

RQ3: To what degree do adults in Germany perceive negative and/or positive OSA and sexting outcomes?

RQ4: Which background variables (gender, age, marital status, education, sexual identity) predict perceived positive and negative OSA and sexting outcomes among adults in Germany?

Method

Participants and procedure

The current study was designed as a quantitative online survey. To collect a national sample of internet users from Germany, a professional online panel provider was engaged. The questionnaire was based on previous studies (Döring et al., 2017; Fleschler Peskin et al., 2013) and included questions regarding (a) sociodemographic characteristics, (b) OSA and sexting prevalence and frequency, and (c) perceived negative and positive OSA and sexting outcomes. The questionnaire was carefully pretested: All items in the draft version were examined several times by researchers and pretest participants. The panel provider checked the online version for completeness, correctness of the texts, and error messages, then finally performed a data check. The study was conducted in accordance with the guidelines of the Research Ethics Committee of the American Psychological Association.

The panel provider drew a quota sample representative of internet users in Germany based on gender, age, education, marital status, and federal state of Germany as quota variables. If a quota

criterion was met (e.g. the quota for an age group), further participants covered by the criterion were prevented from taking part in the survey. All criteria could be fulfilled, which led to a representative quota sample. Data collection took place in November 2015. Firstly, participants were directed to an informed consent page and were only selected if they gave informed consent and were over 18 years old. It took approximately 4–5 min to complete the online questionnaire and participants received 50 Euro cents as compensation, which is the compensation usually offered for completing questionnaires of this kind.

Of 10,052 invited panel members, 1,643 participants completed the questionnaire (completion rate of 16.3%). From those, 143 participants were excluded from the sample during quality control: that is, users who showed an unrealistically fast processing time, problematic response patterns (e.g., the same value for a block of items), and/or meaningless responses (e.g., “asderersdf”). The final sample comprised of 1,500 German internet users aged 18–85 years (for sociodemographic characteristics of participants see Table 1).

Table 1. Sociodemographic Characteristics of Participants ($N = 1,500$).

Sociodemographic characteristics	<i>n</i>	%
Gender		
Women	723	48
Men	777	52
Age		
18–29	325	22
30–39	278	19
40–49	334	22
50–59	300	20
60–69	164	11
70–79	97	6
80–89	2	<1
Marital status		
Unmarried	493	33
Married	839	56
Divorced/widowed	168	11
Education		
No graduation	13	1
Grade school without professional training	391	26
Junior high school	542	36
High school	554	37
Sexual identity		
Heterosexual	1,297	87
Homosexual	63	4
Bisexual	74	5
Other	66	4

Measures

Sociodemographic characteristics

In response to the respective questionnaire items, participants gave their sociodemographic characteristics, including gender (female, male); age (in years); marital status (single, married, divorced/widowed); education (no graduation, grade school without professional training, junior high school, high school); and sexual identity (heterosexual, homosexual, bisexual, asexual, other). Based on previous studies (e.g., Comartin, Kernsmith, & Kernsmith, 2013; Dir, Coskunpinar, & Cyders, 2014; Döring et al., 2017; McDaniel & Drouin, 2015), these sociodemographic characteristics were used as predictors of OSA and sexting. For statistical regression analyses, response options for marital status, education, and sexual identity were collapsed into dichotomous variables (currently married vs. not-currently married, heterosexual vs. sexual minority, education low vs. high level and education medium vs. high level).

OSA

Participants responded to six questions (“How often do you use the internet in order to ...?”) based on Döring et al. (2017) that assessed their involvement in six types of OSA: (a) sexual information/education; (b) erotica/pornography; (c) adult dating/cybersex; (d) sexual scenes/communities; (e) sexual merchandise/sex shops; and (f) sex work on the internet. An operational definition for each type of OSA was added at the beginning of each item. All items were measured

on a 5-point Likert scale ranging from 1 (*never*) to 5 (*very often*). For each item, as well as for the total score, the lifetime prevalence was computed, that is, the proportion of practitioners. Practitioners were operationally defined as participants that indicated at least “infrequent” practice of the type of OSA in question (in case of a single item), or participants that indicated at least “infrequent” practice of at least one of the six types of OSA (in case of the total score), respectively. In addition, two mean values were computed that represent the frequency of use. The first mean value was based on all participants (M_T), whereas the second mean value included only practitioners (M_P ; see Table 2).

Sexting

Participants responded to three questions (“Did you ever ...?”) based on Fleschler Peskin et al. (2013) and similar items used in other sexting studies (for an item overview, see Döring, 2014). This was intended to assess their involvement in three types of sexting: sending self-created erotic or sexually explicit (a) texts, (b) photos, and (c) videos to another person (for a critical analysis of sexting definitions, see Barrense-Dias, Berchtold, Surís, & Akre, 2017). All items were measured on a 5-point Likert scale ranging from 1 (*never*) to 5 (*very often*). Again, in the same way as described above, the *lifetime* prevalence and the two frequencies of use were computed (see Table 2). In addition, it was assessed who the target of sexting was (“does apply” vs. “does not apply”): (a) the spouse/relationship partner, (b) the

Table 2. Lifetime Prevalences and Frequencies of Online Sexual Activities (OSA) and Sexting Among Adults in Germany ($N = 1,500$).

Variables	N	LP	99% CI	M_T^a	SD_T^a	M_P^a	SD_P^a
OSA	1015	68%	[65%, 71%]	1.53	0.67	2.56	0.61
Getting sexuality information online	831	55%	[52%, 59%]	1.83	0.91	2.51	0.68
Getting sexually stimulating material online	719	48%	[44%, 52%]	1.90	1.12	2.87	0.89
Buying sexual products online	580	39%	[36%, 42%]	1.62	0.91	2.61	0.76
Finding new sexual partners online	286	19%	[16%, 22%]	1.34	0.80	2.80	0.88
Participating in online sexual communities	229	15%	[13%, 18%]	1.30	0.79	2.96	0.92
Paying for online sexual services	157	11%	[08%, 12%]	1.20	0.63	2.87	0.83
Sexting	619	41%	[38%, 45%]	1.47	0.76	2.66	0.69
Sending sexual text messages via phone	592	39%	[36%, 43%]	1.71	1.02	2.79	0.81
Sending sexual photos of oneself via phone	378	25%	[22%, 28%]	1.44	0.86	2.75	0.80
Sending sexual videos of oneself via phone	214	14%	[12%, 17%]	1.25	0.69	2.79	0.79

Note. LP: lifetime prevalence; CI: confidence interval based on bootstrapping with 1,000 resamples; M_T : mean total sample; SD_T : standard deviation total sample; M_P : mean practitioners only; SD_P : standard deviation practitioners only.

^aFrequency scale: 1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often.

partner in an affair/casual relationship, (c) a person whom one wished to get to know, or (d) an “other” person who does not fall into categories a–c (multiple selections were possible).

Perceived OSA and sexting outcomes

To measure the subjective sexual well-being impact of OSA and sexting, practitioners of OSA ($N=1,015$) and sexting ($N=619$) reported to which degree they perceived negative (“How far has ... had a negative impact on you?”) and positive outcomes (“How far has ... had a positive impact on you?”) of their OSA and sexting behaviors on four 7-point Likert scales ranging from 1 (*not at all*) to 7 (*to a high degree*). Perceived positive and negative outcomes were conceptualized as independent dimensions and therefore measured separately for both OSA and sexting.

Analyses

All statistical analyses were performed with IBM SPSS 24. We calculated lifetime prevalence rates and their 99% confidence intervals (CI) for OSA and sexting, as well as frequencies (RQ1). Next, we separately conducted two multiple linear regression analyses to examine which background variables (gender, age, marital status, education, sexual identity) predict involvement in OSA and sexting (RQ2). To explore whether OSA and sexting outcomes were perceived as more negative or more positive, we conducted two *t*-tests for repeated measurements (perceived positive vs. negative outcomes of OSA and perceived positive vs. negative outcomes of sexting; RQ3). Finally, to examine which background variables (gender, age, marital status, education, sexual identity) predict perceived negative and positive outcomes of OSA and sexting, we separately conducted four multiple linear regressions (predictors of perceived negative OSA outcomes, predictors of perceived positive OSA outcomes, predictors of perceived negative sexting outcomes, predictors of perceived positive sexting outcomes; RQ4). Given our large sample size, we used a significance level of $p < .01$ to avoid Type I errors.

Results

Prevalence and frequency of OSA and sexting

To answer RQ1, the percentages and means of involvement in OSA and sexting were examined. The lifetime prevalence of OSA and sexting among adults in Germany are shown in Table 2: 68% of participants reported involvement in at least one type of OSA, and 41% reported involvement in at least one type of sexting. The most prevalent OSA type was accessing sexual information online (55%). The most prevalent sexting type was sending a self-created erotic or sexually explicit text message (39%). The typical target of a sexting message was the spouse/relationship partner (68%), followed by the partner in an affair/casual relationship partner (38%), a person whom one wished to get to know (19%), and finally an “other” person (12%). In terms of frequency, it turned out that on average, practitioners of OSA and sexting “sometimes” (i.e., mean values close to $M=3.00$ on a 5-point Likert scale) became involved in different OSA and sexting types (see Table 2).

Predictors of OSA and sexting

Multiple linear regressions were conducted to answer RQ2 and to predict involvement in OSA and sexting among adults in Germany based on gender, age, marital status, education, and sexual identity. A check of statistical assumptions showed that multicollinearity was not a problem, as no variance inflation factor was larger than 1.4 (O’Brien, 2007). However, the assumption of normally distributed residuals was violated because the criterion variables were distributed non-normally. Therefore, regression parameters were bootstrapped with 1,000 resamples. The multiple regression model for OSA involvement was statistically significant, $F(6, 1493) = 42.39$, $p < .001$, $R^2 = .15$. Gender ($\beta = .24$, $p = .001$), age ($\beta = -.28$, $p = .001$), and sexual identity ($\beta = -.12$, $p = .001$) significantly predicted OSA involvement among adults in Germany (see Table 3). Being male, young, and a member of a sexual minority was related to a greater OSA involvement. The multiple regression model for sexting was also statistically significant, $F(6, 1493) = 37.18$, $p < .001$,

Table 3. Predictors of Involvement in Online Sexual Activities (OSA) and Sexting Among Adults in Germany ($N = 1,500$).

Variables	B	$SE\ B$	β	t	p	sr
OSA						
Gender	0.32	0.03	.24	9.73	.001	.23
Age	-0.01	<0.01	-.28	-10.87	.001	-.26
Marital status	-0.06	0.03	-.05	-1.81	.076	-.04
Education (low vs. high level)	-0.01	0.04	-.01	-0.23	.802	-.01
Education (medium vs. high level)	0.01	0.04	.00	0.13	.884	.00
Sexual identity	-0.23	0.05	-.12	-4.86	.001	-.12
Sexting						
Gender	0.14	0.04	.09	3.63	.002	.09
Age	-0.02	<0.01	-.31	-12.21	.001	-.30
Marital status	-0.11	0.04	-.07	-2.84	.006	-.07
Education (low vs. high level)	-0.02	0.05	-.01	-0.41	.670	-.01
Education (medium vs. high level)	0.03	0.05	.02	0.64	.536	.02
Sexual identity	-0.22	0.06	-.10	-4.08	.001	-.10

Note. Regression analysis summary. $R^2_{OSA} = .15$ ($N = 1,500$, $p < .001$). $R^2_{Sexting} = .13$ ($N = 1,500$, $p < .001$). $SE\ B$ and p are based on bootstrapping with 1,000 resamples. No variance inflation factor was larger than 1.382. sr : semipartial correlation coefficient.

$R^2 = .13$. Gender ($\beta = .09$, $p = .002$), age ($\beta = -.31$, $p = .001$), marital status ($\beta = -.07$, $p = .006$), and sexual identity ($\beta = -.10$, $p = .001$) significantly predicted sexting among adults in Germany (see Table 3). Being male, young, a member of a sexual minority, and not currently married was coincided with greater engagement in sexting.

Gender, age, and sexual identity emerged as the most influential predictors for both OSA and sexting involvement. To provide more details about these predictors, Table 4 displays lifetime prevalence and frequencies of the different gender, age, and sexual identity groups for OSA as well as for sexting.

Perceived OSA and sexting outcomes

To answer RQ3, the degree of perceived negative and positive OSA and sexting outcomes was measured and compared: Practitioners of OSA ($N = 1,015$) reported that they perceived positive OSA outcomes ($M = 2.98$, $SD = 1.77$) to a significantly higher degree than negative OSA outcomes ($M = 2.10$, $SD = 1.48$); $t(1014) = 15.06$, $p < .001$; $d = 0.47$. Slightly more than half of the practitioners (54%) perceived no negative effects of OSA at all. Regarding practitioners of sexting ($N = 619$), perceived positive outcomes ($M = 3.64$, $SD = 1.85$), also significantly outweighed negative outcomes ($M = 2.20$, $SD = 1.52$); $t(618) = 16.28$, $p < .001$, $d = 0.65$. Exactly half of the practitioners (50%) perceived no negative effects of sexting at all.

Table 4. Lifetime Prevalences and Frequencies of Online Sexual Activities (OSA) and Sexting in Different Gender, Age, and Sexual Identity Groups of Adults in Germany ($N = 1,500$).

Variables	LP_{OSA}	M_{OSA}^a	SD_{OSA}^a	$LP_{Sexting}$	$M_{Sexting}^a$	$SD_{Sexting}^a$
Gender						
Women	59%	2.45	0.55	40%	2.58	0.66
Men	76%	2.64	0.64	42%	2.73	0.70
Age						
18–29	84%	2.56	0.52	65%	2.67	0.68
30–39	77%	2.70	0.67	56%	2.67	0.73
40–49	73%	2.63	0.69	44%	2.76	0.74
50–59	60%	2.44	0.57	25%	2.54	0.56
60–69	38%	2.32	0.47	12%	2.33	0.57
70–79	41%	2.41	0.49	13%	2.40	0.47
80–89	0%	0.00	0.00	0%	0.00	0.00
Sexual identity						
Heterosexual	67%	2.53	0.59	40%	2.64	0.67
Homosexual	81%	3.02	0.81	63%	2.99	0.96
Bisexual	89%	2.69	0.60	64%	2.71	0.60
Other	50%	2.38	0.48	15%	2.17	0.36

Note. LP_{OSA} : lifetime prevalence for online sexual activities in the subsample; M_{OSA} : mean online sexual activities; SD_{OSA} : standard deviation online sexual activities; $LP_{Sexting}$: lifetime prevalence for sexting in the subsample; $M_{Sexting}$: mean sexting; $SD_{Sexting}$: standard deviation sexting.

^aFrequency scale: 1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often.

Predictors of perceived OSA and sexting outcomes

Multiple linear regressions were conducted to answer RQ4, using gender, age, marital status, education, and sexual identity as OSA and sexting outcome predictors. A check of assumptions showed that multicollinearity was not a problem, as no variance inflation factor was larger than 1.4 (O'Brien, 2007). However, once again, the assumption of normally distributed residuals was violated because the criterion variables were distributed non-normally. Again, regression parameters were bootstrapped with 1,000 resamples. The multiple regression model for perceived positive OSA outcomes was significant, $F(6, 1008) = 13.44$, $p < .001$, $R^2 = .07$: Gender ($\beta = .22$,

Table 5. Predictors of Online Sexual Activities (OSA) and Sexting Outcomes Among Adults in Germany ($N = 1,015/N = 619$).

Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	<i>sr</i>
Positive OSA outcomes						
Gender	0.79	0.11	.22	6.92	.001	.21
Age	-0.02	0.00	-.14	-4.06	.001	-.12
Marital status	-0.06	0.12	-.02	-0.55	.600	-.02
Education (low vs. high level)	-0.02	0.14	-.00	-0.10	.921	-.00
Education (medium vs. high level)	-0.00	0.13	-.00	-0.02	.982	-.00
Sexual identity	-0.66	0.16	-.13	-4.30	.001	-.13
Negative OSA outcomes						
Gender	0.40	0.10	.13	4.17	.001	.13
Age	-0.02	0.00	-.23	-6.66	.001	-.20
Marital status	0.13	0.10	.04	1.33	.176	.04
Education (low vs. high level)	0.11	0.13	.03	0.87	.411	.03
Education (medium vs. high level)	-0.01	0.11	-.00	-0.06	.969	-.00
Sexual identity	-0.48	0.13	-.12	-3.76	.001	-.12
Positive sexting outcomes						
Gender	0.69	0.15	.19	4.56	.001	.18
Age	-0.01	0.01	-.08	-1.81	.092	-.07
Marital status	0.04	0.16	.01	0.28	.781	.01
Education (low vs. high level)	-0.08	0.19	-.02	-0.40	.671	-.02
Education (medium vs. high level)	-0.34	0.17	-.09	-2.01	.048	-.08
Sexual identity	-0.52	0.20	-.10	2.58	.013	-.10
Negative sexting outcomes						
Gender	0.27	0.13	.09	2.18	.029	.09
Age	-0.01	0.01	-.11	-2.49	.015	-.10
Marital status	0.17	0.13	.06	1.35	.190	.05
Education (low vs. high level)	0.32	0.17	.09	1.92	.054	.08
Education (medium vs. high level)	-0.12	0.14	-.04	-0.84	.385	-.03
Sexual identity	-0.31	0.18	-.07	-1.85	.086	-.07

Note. Regression analysis summary based on practitioners of OSA ($N=1,015$) and sexting ($N=619$). $R^2_{OSA\ Positive} = .07$ ($N=1,015$, $p < .001$). $R^2_{OSA\ Negative} = .06$ ($N=1,015$, $p < .001$). $R^2_{Sexting\ Positive} = .05$ ($N=619$, $p < .001$). $R^2_{Sexting\ Negative} = .03$ ($N=619$, $p = .005$). *SE B* and *p* are based on bootstrapping with 1,000 resamples. No variance inflation factor was larger than 1.369. *sr*: semipartial correlation coefficient.

$p = .001$), age ($\beta = -.14$, $p = .001$), and sexual identity ($\beta = -.13$, $p = .001$) significantly predicted perceived positive OSA outcomes. In addition, the multiple regression model for perceived negative OSA outcomes was statistically significant, $F(6, 1008) = 11.18$, $p < .001$, $R^2 = .06$, with the same predictors: gender ($\beta = .13$, $p = .001$), age ($\beta = -.23$, $p = .001$), and sexual identity ($\beta = -.12$, $p = .001$). Regression coefficients can be found in Table 5. It turned out that adults in Germany who are more involved in OSA (men, younger adults, members of sexual minorities; see Table 4) simultaneously perceived more positive and more negative OSA outcomes when compared to other population groups (see Table 5).

The multiple regression model for *perceived positive sexting outcomes* was statistically significant, $F(6, 612) = 5.48$, $p < .001$, $R^2 = .05$, with gender ($\beta = .19$, $p = .001$) and sexual identity ($\beta = -.10$, $p = .013$) as the most influential predictors. The multiple regression model for perceived negative sexting outcomes was also statistically significant, $F(6, 612) = 3.15$, $p = .005$, $R^2 = .03$, with age ($\beta = -.11$, $p = .015$) being the most influential predictor. Regression coefficients

can be found in Table 5. Being male and a member of a sexual minority predicted perceived positive sexting outcomes, while being a younger adult predicted perceived negative sexting outcomes. However, two of the most influential predictors (sexual identity and age) had *p* values slightly above the significance threshold of $p = .010$.

Discussion

The uses of the internet and mobile phones are numerous, including sexuality-related use in terms of OSA and sexting. Although OSA and sexting are often discussed as problematic behaviors of adolescents, the prevalence and outcomes among adults of the general population are widely unknown. This study aimed to bridge this research gap by answering four pertinent research questions.

Summary and interpretation of results

The first research question addressed the lifetime prevalence and frequency of OSA and sexting among adults in Germany. It turned out that two

thirds of adults in Germany (68%) participate in at least one type of OSA. This makes OSA a common and statistically normal type of sexual expression via digital media. Finding sexuality information online (55%), retrieving sexually stimulating material (erotica/pornography) online (48%), and buying sex products online (39%) were the most common subtypes of OSA. This is in line with previous research from other Western countries (Daneback, Månsson, & Ross, 2011; Daneback, Månsson, Ross, & Markham, 2012; Döring et al., 2017). For instance, Döring et al. (2017) found a lifetime prevalence of 90% for sexuality information and a lifetime prevalence of up to 77% for erotica/pornography among college students.

With 41% of adults in Germany involved in at least one type of sexting, this form of sexual expression via mobile phone is also becoming more and more common. Regarding sexting subtypes, the sending of sexual text messages was most frequent (40%), followed by self-created sexual photo messages (25%) and sexual video messages (14%). This result falls in line with previous research indicating that sexting—albeit often framed as adolescent behavior—is more widespread among adults than adolescents (Courtice & Shaughnessy, 2017; Döring, 2014).

Although lifetime prevalence rates of OSA and sexting in the general population are fairly high, on average, the frequency of OSA and sexting involvement is neither very low nor very high, but moderate. Typically, adults in Germany will “sometimes” search for sexuality information online, will “sometimes” consume cybererotica or cyberpornography, and will “sometimes” send a sexting message via mobile phone.

The second research question concerned the predictors of OSA and sexting involvement among adults in Germany. The most influential predictors of increased OSA and sexting involvement were gender (being male), age (being a younger adult), and sexual identity (being a member of a sexual minority). These results are in accordance with previous research: It has often been confirmed that male internet users are more involved in OSA, especially in using online pornography (e.g., Döring et al., 2017). According to meta-analyses, the largest gender differences in

sexual behaviors exist in regard to masturbation frequency and pornography use (see Petersen & Hyde, 2010). It is comparably well established that younger adults have a stronger interest in sexuality, as well as in digital media when compared to older people (Dimaggio, Hargittai, Celeste, & Shafer, 2004; Ludeman, 1981). Therefore, it is not surprising that younger adults practice OSA and sexting more intensively than older people (Döring et al., 2017). Last but not least, it is plausible that members of sexual minorities who have fewer offline opportunities for contact, support, and information more often turn to digital media for the expression of their sexualities: They actively engage in gay, lesbian, or queer online communities, online dating platforms, and sexting (Currin & Hubach, 2017; Garofalo, Herrick, Mustanski, & Donenberg, 2007; Kosenko, Bond, & Hurley, 2018).

The third research question addressed the perceived outcomes of OSA and sexting among adults in Germany. Academic literature and public discussion emphasize the risks of OSA and sexting, for instance, the risk of online pornography addiction or the unwanted dissemination of intimate sexting pictures followed by public shaming and/or (cyber)bullying (Anastassiou, 2017; Döring, 2009, 2014; Hill, 2011). However, according to the positive sexuality approach (Williams et al., 2015), we must also consider the opportunities of a positive expression of sexuality via digital media. Therefore, our study assessed perceived negative and positive outcomes independently from one another. It was revealed that adults in Germany perceived more positive than negative outcomes when engaging in OSA and sexting activities. This finding is in line with previous research comparing positive and negative outcomes (Groß et al., 2011; Shaughnessy et al., 2014). The perceived negative OSA and sexting outcomes scored a value of 2 on a 7-point Likert scale, whereas the perceived positive OSA outcomes scored a value of around 3, and the perceived positive sexting outcomes even scored a value of around 4. The dominance of perceived positive over perceived negative outcomes is clear. In the context of the 7-point Likert scale, however, all of the values seem to be fairly small. They have to be interpreted in relation to the

moderate frequency of the respective behaviors: Moderately frequent behaviors are likely to have a lesser effect than very frequent behaviors. It is interesting to note that adults reported more positive outcomes of sexting than of OSA, a finding that contradicts the public perception of sexting being a very risky and harmful behavior.

The fourth and last research question investigated the predictors of perceived positive and negative outcomes of OSA and sexting. It was revealed that those who practice OSA and sexting the most (i.e., men, younger adults, and members of a sexual minority) perceive more positive, as well as more negative outcomes when compared to other segments of the population. Nevertheless, even in this subsegment the perceived positive outcomes dominate the negative outcomes. People who intensively practice OSA and sexting profit more from the benefits of sexual well-being, but increase their risk of unpleasant experiences at the same time. For instance, people with a higher consumption of sexually explicit online content will be confronted more often with both appealing and repulsing online content. People who use the internet intensively for the search for sexual partners have a higher chance of establishing desirable new contacts and relations, but will more often suffer from negative side-effects like online romance scams or sudden break-ups. Members of sexual minorities who come out online will find social support and identity validation on the Internet, but will be targeted by online hate speech at the same time.

Polarized public and academic debates that frame the sexual expression via digital media as something highly dangerous exaggerate the real effect sizes. They also often ignore the ambivalence of the phenomenon under discussion. In summary, if OSA and sexting are used more intensively, this leads to more intense outcomes. Nevertheless, regarding adults in Germany, this study shows that the perceived negative outcomes are less pronounced than the positive outcomes.

Limitations and strengths of the study

This study comes with limitations. Based on a survey methodology, it only collected self-report data (Schwarz, 1999). Self-report data on online

sexual activities and sexting are often less valid than objective data (e.g., log-file recording on digital devices), and the data lack certain outcome dimensions that could only be covered by objective data (e.g., medical assessment of sexual health; partner's evaluation of sexual relationship). In addition, the survey methodology requires a quantitative research approach with standardized questions, whereas a qualitative research approach would have produced more details on the individual contexts and personal significance of OSA and sexting behaviors.

The study used a quota sample from an online access panel. Although basic sociodemographic variables like gender, age, marital status, education, and federal state of the sample mirror the population of German internet users, a quota sample is still more biased and less representative than a true random sample. However, in comparison to the widespread use of convenience and community samples in OSA and sexting research, surveying a national quota sample can be regarded as a step forward (Klettke et al., 2014).

Although the online questionnaire granted respondents anonymity, there may have been some underreporting for reasons of social desirability (Kelly, Soler-Hampejsek, Mensch, & Hewett, 2013). Older people in particular may have been reluctant to fully admit to their OSA and sexting involvement. The instrument only measured OSA and sexting outcomes in a general sense. Future studies should also measure positive and negative OSA and sexting outcomes on a more detailed level (e.g., specific positive and negative outcomes on body image, on sexual identity, on sexual intimacy, on relationship quality, and on sexual pleasure in both solo and partnered sex).

Despite the limitations mentioned above, this study draws strength from the fact that we were able to survey a national quota sample of $N = 1,500$ adults from Germany (aged 18–85). Other studies used small convenience samples. Moreover, this study is one of the first covering OSA and sexting with all of their main sub-dimensions at the same time, therefore providing a broad picture of OSA and sexting involvement. Previous studies have generally focused solely on

selected OSA or sexting subtypes and have therefore provided a more limited picture of sexual expression via digital media. Last, but not least, having operated within a positive sexuality framework, the study may be one of the rare studies assessing both perceived negative and positive outcomes of OSA and sexting in a balanced manner. Many other studies have measured negative outcomes alone.

Outlook

Altogether, more than half of the respondents involved in OSA or sexting perceived absolutely no negative effects of their OSA (54%) or of their sexting (50%). Instead, they perceived predominantly positive sexual well-being effects. These results support the positive sexuality framework's claim that the popular deficit approach to human sexuality is not adequate: It is clear that adults in Germany within the last decades have found new ways of sexual expression via digital media that produce more positive than negative outcomes for them. In other words: The sexual online activities are rather good than bad for their sexual well-being. It should be the subject of further research exactly what these positive outcomes are and how population groups differ in the ways they perceive OSA and sexting as helpful to their sexual well-being and sexual health. In addition, the predictors for specific positive outcomes of OSA and sexting should be identified, such as improved body image, improved intimate communication between partners, improved sexual pleasure in solo or partnered sex, or validation of one's sexual identity. Key predictors for positive OSA and sexting outcomes might be human strengths in the form of social skills, sexual skills, and digital media skills.

The current findings have several practical implications for the fields of sexuality education, sexual counseling and therapy, and sexual medicine. Instead of viewing OSA and sexting mainly as problems, it may be more productive to consider them also as potential solutions. Digital media offer new ways of sexual expression that can contribute to happiness and fulfilment with one's own unique sexuality. Therefore, sexual health professionals should be prepared to

acknowledge sexual expression via digital media as normal and potentially helpful, and to support their clients in improving their sexual lives both offline and online. In the future, the focus might move from young people and their OSA and sexting behaviors toward the sexual needs, wants, and rights of the growing population of older people (Barrett & Hinchliff, 2018), including disabled people (Tepper, 2000) who can benefit in specific ways from technologically enhanced sexual expression. The focus might also move from sexuality-related internet and smartphone use to more advanced upcoming technologies such as sex robots (Sharkey, van Wynsberghe, Robbins, & Hancock, 2017), which easily trigger new fears and moral panics and therefore deserve a balanced scientific evaluation including both negative and positive outcomes.

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